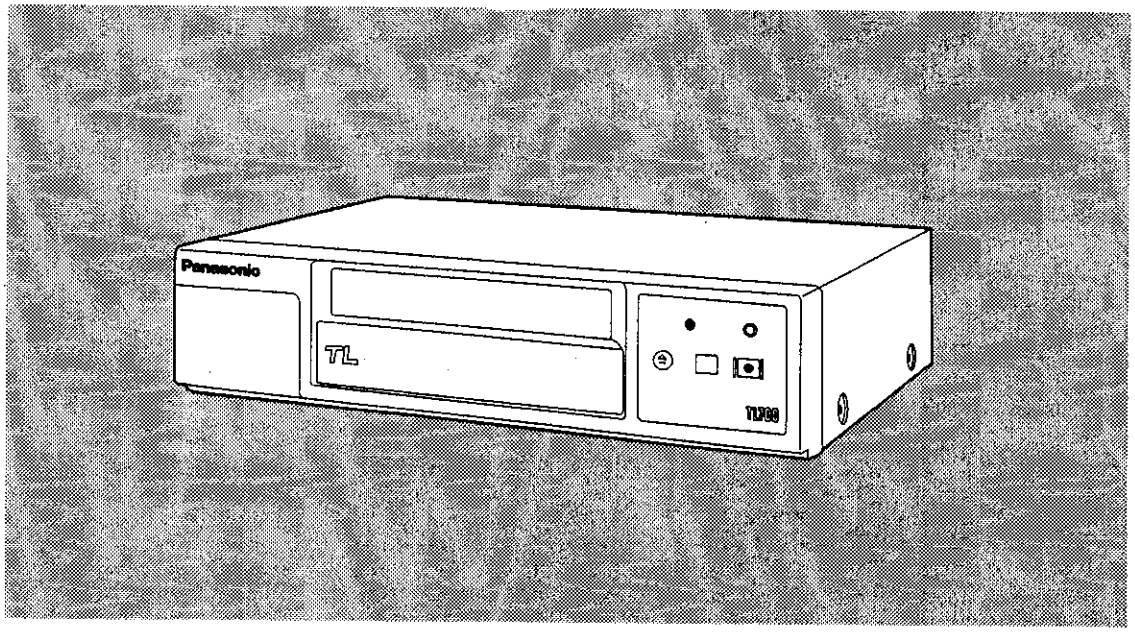
Operating Instructions

S-VHS 625 VHS PAL

Time Lapse Recorder

Model AG-TL700 B E



Panasonic

Before attempting to connect, operate or adjust this product, please read these instructions completely.

Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ⓚ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

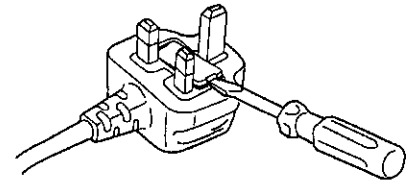
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

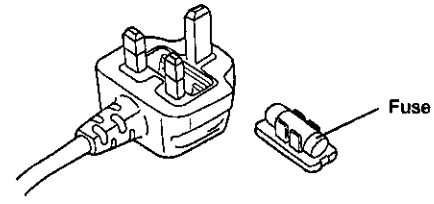
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.
- Under no circumstances should either of these wires be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚.

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



■ **DO NOT REMOVE PANEL COVER BY UNSCREWING.**
To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

■ If the unit is not going to be used for length of time, turn the power OFF and disconnect the power plug from the AC outlet.

WARNING:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:
Do not install or place this unit in a bookcase, built in cabinet or in another confined space in order to keep well ventilated condition. Ensure that curtains and any other materials do not obstruct the ventilation condition to prevent risk of electric shock or fire hazard due to overheating.

☐ is the safety information.

Lithium Battery

Warning
The lithium battery in this equipment must only be replaced by qualified personnel. When necessary, contact your local Panasonic supplier.

'The lithium battery is a critical component (type number VL2330/1HF manufactured by Panasonic.)

It must never be subjected to excessive heat or discharge. It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacturer. They must be fitted in the same manner and location as the original battery, with the correct polarity connctions observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose. It should be disposed of in waste products destined for burial rather than incineration."

CAUTION
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

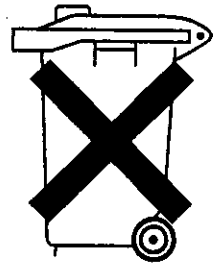
VARNING
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL
Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyypiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

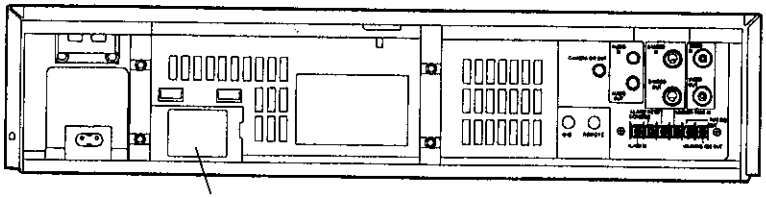
Attention/Attentie

A battery is used for memory-backup in the unit. When the battery is exhausted, you should not throw it away, but dispose of it as small chemical waste.
Voor het reservegeheugen van het apparaat wordt gebruikgemaakt van een batterij. Wanneer de batterij is uitgeput, mag u deze niet gewoon weggooien, maar dient u deze als klein chemisch afval weg te doen.

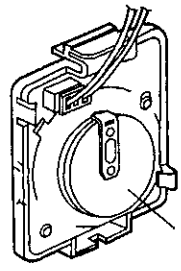


Removing the battery/Verwijderen van de batterij

Battery for memory-backup (lithium battery)/
Batterij voor reservegeheugen (lithiumbatterij)
Remove the battery from the unit.
Verwijder de batterijhouder uti het apparaat.



Battery holder/Batterijhouder



Lithium battery/Lithiumbatterij

To replace the battery, please consult your local dealer.
Voor het vernieuwen van de batterij dient u uw plaatselijke handelaar te raadplegen.

Contents

Features 5

Regular Maintenance Service Recommendation 5

Parts And Their Functions 6

Menu Screens 9

Date and Time Settings 12

Time/Date Display Position 15

Time Mode Selection 16

Recording Procedure 17

Tips For Better Recording 18

- Recording Mode Lock 18
- Hour Meter 18
- Recording Check 18
- Restoration-of-Power-After-Failure Recording 18

Timer Recording 19

- Internal Timer Recording 19

Daily Recording (Daily Timer)/ Weekly Recording (Weekly Timer) 21

- External Timer Recording 23

Auto Repeat Recording/Auto Rewinding 24

Alarm Recording (Emergency Recording) 25

- Alarm Recall 27

Sequential Switcher Connection and Recording 28

Playback Procedure 29

Routine & Regular Inspection Request 30

Troubleshooting 31

Specifications 33

- Do not insert fingers or any objects into the video casette holder.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, protect it from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Colour or Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to authorized service personnel.

Features

Recording and playback up to 170-hour time modes
In addition to the 3-hour time modes, recording and playback can be performed in the time lapse modes (L12-, L24-, 24-, 48-, 72-, 96-, 120-, 170- hour modes).

Excellently defined still-picture images
More clearly defined still picture images can be produced during playback in the S-VHS/colour mode thanks to the horizontal resolution of 400 lines.

Full line-up of recording functions
Included in the wide range of recording functions are restoration-of-power-after-failure recording, recording every day and by the days of the week using the internal timer, external timer recording, alarm recording, emergency recording and repeat recording.

Playback functions
Among the convenient playback functions are the recording review function for immediate viewing of recorded material, the handy search function for locating images promptly, and the forward/reverse field advance and still-picture functions for careful viewing of particular scenes.

Auto tracking function
The tracking can be automatically adjusted by pressing the "–" and + tracking buttons together.

Built-in time/date generator
This unit comes with a built-in microprocessor with a calendar function for displaying the time on the display or TV monitor and for controlling the time of the internal timer.

Recording lock function
A double recording mode lock function is provided for safeguarding against operational errors during recording.

Connection to frame switcher
Easy connection to a frame switcher is possible once the unit has been connected to the video input and camera SW connectors.

Hour meter
The unit contains an hour meter which provides useful information for maintenance and inspections.

Remote control
The unit can be operated from a distance of about 5 meters if the AG-A11 remote controller, available as an optional accessory, is connected.

IMPORTANT
"Unauthorized recording of copyrighted television programmes, films, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."

Regular Maintenance Service Recommendation

Although this unit is designed to withstand long-term use, the items listed below should be inspected regularly so that the unit is kept in perfect working order. Use the hour meter to know when to conduct the inspections.
The VTR is a piece of precision-made equipment and, as such, it is recommended that the user enter into a maintenance and inspection agreement to keep the unit operating free of trouble or failures. For further details, please consult with your dealer.

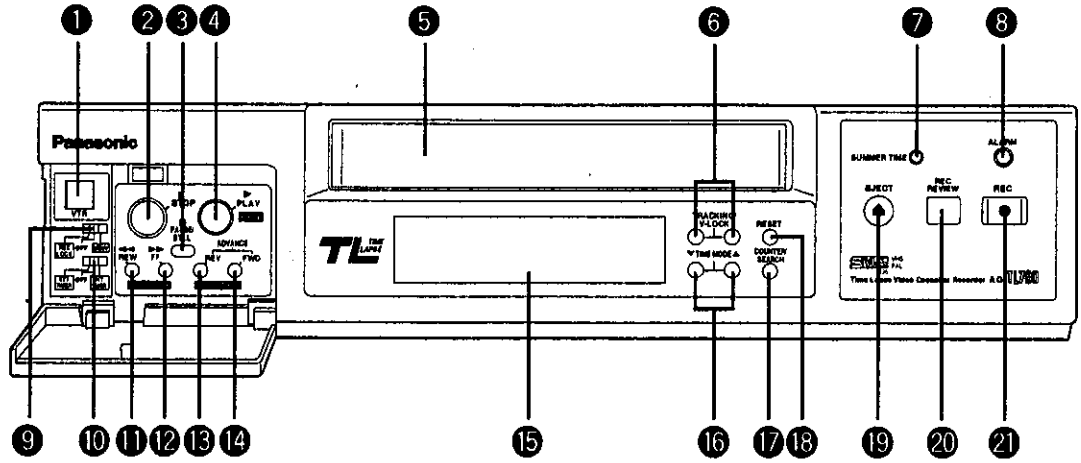
Cumulative operation time (hours) / Inspection item	Model number	500	1000	2000	3000	4000	5000	6000	10000
Transport system cleaning		●	●	●	●	●	●	●	●
Audio heads	VBR0178	●	●	●	●	●	◎	●	◎
Video heads	VEH0679	●	◎	◎	◎	◎	◎	◎	◎
Cylinder unit	VEG1163	●	●	●	●	●	◎	●	◎

(12-/24-hour mode use)

◎ Service life inspection
● Cleaning

The above table merely serves to lay down general guidelines for the inspection of typical parts involved in regular inspections. The timing of the inspections needs to be adjusted according to the VTR's operating environment.

Parts And Their Functions



1 VTR switch
The power is turned on when this switch is pressed. When the switch is pressed again, the power is turned off.

2 STOP button
When this is pressed, the tape stops traveling.

3 PAUSE/STILL button
When this is pressed during recording, the tape temporarily stops traveling.
When pressed during playback, the tape temporarily stops traveling, and a still picture appears on the TV monitor. When pressed again, the tape travel resumes.

4 PLAY (page) button
Playback starts when this button is pressed. The pages on the menu screen are advanced when the button is pressed while a menu screen is displayed.

5 Cassette holder
This is the loading slot for the video cassette.

6 Tracking (–, +) buttons/Vertical hold buttons
These buttons are used to adjust the tracking or to compensate the vertical dancing during still picture.
If noise appears on the playback picture, press the buttons to adjust the tracking is such a way that the picture is made as clear as possible. When both buttons are pressed together, the tracking is adjusted automatically.
If the image shakes slightly in the vertical direction during still picture, press the vertical hold buttons to reduce the dancing.

7 SUMMER TIME button
This is used to switch between the present time and summer (daylight saving) time.

8 ALARM display lamp
This remains lighted while alarm recording is in progress. It flashes when alarm recording ends.

9 MENU/REC LOCK switch
When this switch is set to REC LOCK, the time mode and operation buttons as well as the power switch cannot be operated while recording is in progress.
When it is set to MENU, the menu screen appears.

10 TIMER MODE (REC MODE) switch
This is the operation switch for internal timer recording or external timer recording. The displays shown below light on the display panel.

INT TIMER: At the times set by the internal timer, the power is automatically turned on or off and recording starts or stops.

OFF: When timer recording is not performed.

EXT TIMER: When the external power is turned on, recording starts automatically.

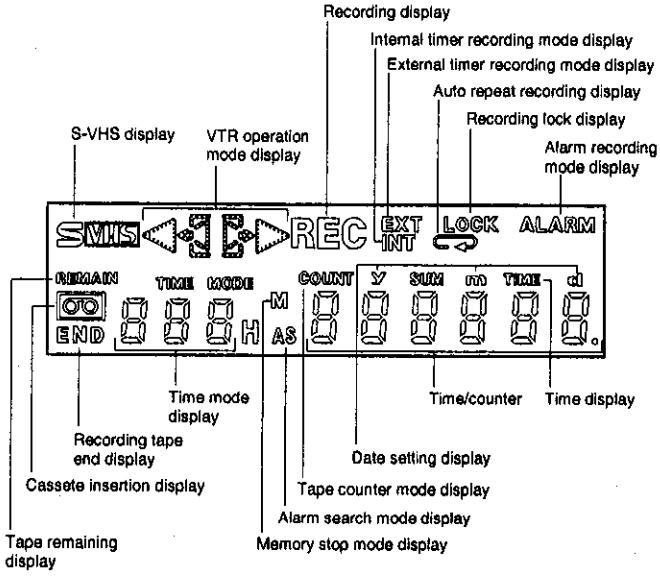
11 REW (shift) button
When this button is pressed, the tape is rewound. When it is kept depressed during playback, the review mode is established.
When it is pressed while a menu screen is displayed, the setting items move downward.

12 FF (shift) button
When this is pressed, the tape is fast forwarded. When it is kept depressed during playback, the unit is placed in the cue mode.
When it is pressed while a menu screen is displayed, the setting items move toward the right.

⓭ **Field REV ADV (set) button**
When this is kept depressed during still-picture playback, the picture is advanced field by field in the reverse direction. When it is released, the still picture reappears. When a menu screen is displayed, it is used to change an item (decrement a value).

⓮ **Field FWD ADV (set) button**
When this is kept depressed during still-picture playback, the picture is advanced field by field in the forward direction. When it is released, the still picture reappears. When a menu screen is displayed, it is used to change an item (increment a value).

⓯ **Display panel**



- Operation mode displays

Operation mode	Display
Playback	▮▶ or ▶
Recording	▶ Rec lamp lights.
Still picture	▮▮
Recording pause	▮▮ Rec lamp lights.
Recording check	▶ Rec lamp lights.
Fast forwarding	▶▶
Rewinding	◀◀
Cue	▶▶
Review	◀◀
Forward field advance	▮▮
Reverse field advance	▮▮

- Error messages
An error code appears when trouble has occurred during operation.
E-2: Trouble in video cassette insertion area
E-3: Trouble in video cassette tape loading area
E-4: Trouble in cylinder area
E-5: Trouble in tape transport area
d: Formation of condensation (dew)

⓰ **TIME MODE button**
This is used to select the recording and playback time mode. Each time this is pressed, the time mode changes in the following sequence:

170H ↔ 3H ↔ L12H ↔ L24H ↔ 24H
↕
120H ↔ 96H ↔ 72H ↔ 48H

⓱ **COUNTER/SEARCH selector button**
When this button is pressed, the display on the display panel changes to time, counter, counter memory, alarm search and number of repeat recording times. The M mark appears on the display panel in the counter memory mode. When the tape is fast forwarded or rewound in this mode, the counter will automatically stop when 0:00:00 is approached. The AS mark appears on the display panel in the alarm search mode. When the tape is fast forwarded or rewound in this mode, the unit is automatically set to still-picture playback at the alarm recording section.
"** PAS" is displayed during repeat recording.
"– –PAS" appears at all other times.
(where "**" denotes the number of repeat times)

⓲ **RESET button**
When this button is pressed, the counter display is reset to 0:00:00.

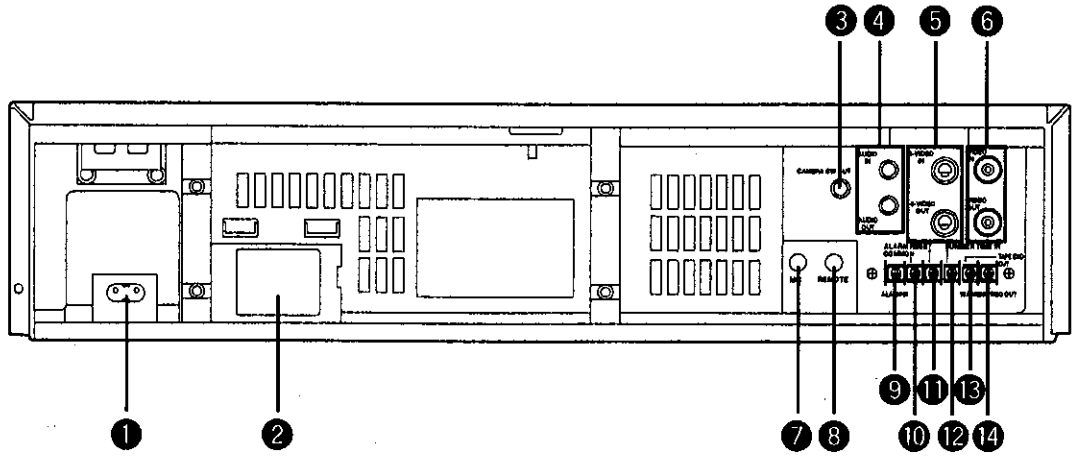
⓳ **EJECT button**
This is used to eject the video cassette.

⓴ **REC REVIEW button**
When the button is pressed during recording, the tape runs temporarily in
the reverse direction, and after the recorded section has been played back, the unit is returned to the recording mode.

㉑ **REC button**
Recording starts when this button is pressed.

For Swedish and Danish Customers

- Aven om denna omkopplare är i "OFF"-läge, gar fortfarande en del av apparaten nätspänning.
- Selv om denne omskifter er i "OFF" stilling, tilføres en del af apparatet stadig strøm.



1 AC IN connector
Connect the supplied power cord to an AC outlet.

2 Battery installation area
Install the battery in this area. See "Lithium Battery" on page 3.

3 Camera switching output connector
Camera switching output connector; connect it to the frame switcher.

4 Audio input/output connectors
Audio input/output connectors (phono jacks)

5 S-VIDEO input/output connectors
For S-Video input/output connectors (4-pin).

6 Video input/output connectors
Video input/output connectors (BNC); connect the input connector to the video camera, etc. and the output connector to the TV monitor, etc.

7 MIC input jack
Input jack (3 mm) for an external microphone.
This jack has precedence when signals are supplied simultaneously to this jack and the audio input connectors.

8 REMOTE control connector
For connecting the AG-A11 remote controller which is available as an optional accessory.

9 Alarm input connector
Alarm recording input connector; connect it to the external sensor.

10 COMMON terminal

11 Alarm reset input connector
Input connector for releasing alarm recording; a +4 to +14V DC voltage is required.

12 SUMMER TIME IN connector
This is used to switch between the present time and summer time. (See page 14.)

13 Tape end output connector
When the cassette tape comes to its end during recording, the alarm deviceinstalled externally is activated.

14 WARNING/REC output connector
When trouble has occurred in the unit, the alarm device installed externally is activated.

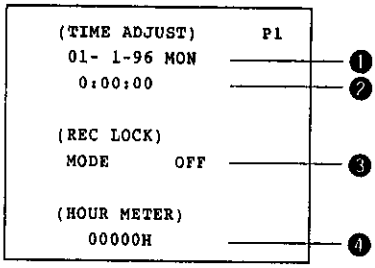
Menu Screens

One of the menu screens appears on the TV monitor when the MENU/REC LOCK switch is set to MENU. The display returns to the regular screen when this switch is set to OFF.

- When a menu screen has appeared, the items are set using the page, shift and set buttons.
- Advance through the pages (page up) of the menu screen using the page button.
- Move the items (downward or toward the right) using the shift button.
- Change the items (increment or decrement the values) using the set button.

MENU SCREEN 1

In addition to the date and time display and the recording mode lock setting which appear on the TV monitor, the hour meter is displayed on Menu Screen 1.



❶ **Date setting (see page 12)**

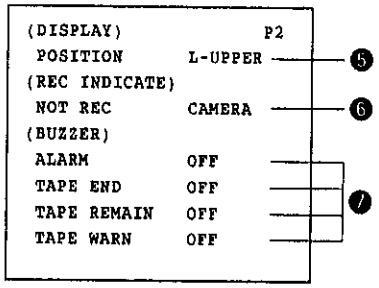
❷ **Time setting (see page 12)**

❸ **Recording mode lock**
ON: LOCK on the front display tube lights up, and all operations except for REC REVIEW are prohibited while recording is in progress.

❹ **Hour meter (see page 18)**
This indicates the unit's total operation time (the cumulative total for the cylinder rotation time).

MENU SCREEN 2

The time/date display position, monitor screen blue display and buzzer settings are performed on Menu Screen 2.



❺ **Display position selection (see page 15)**
This selects the position where the date and time are to be displayed on the TV monitor.
(L-UPPER → R-UPPER → L-BOTTOM → R-BOTTOM → CENTRE → OFF)

❻ **Blue display**
This sets a blue display on the monitor screen at all times except while recording or playback is in progress.
BLUE: The display on the monitor screen is blue at all times except while recording or playback is in progress.
CAMERA: The pictures from the video input connector are shown on the monitor screen at all times except while playback is in progress.

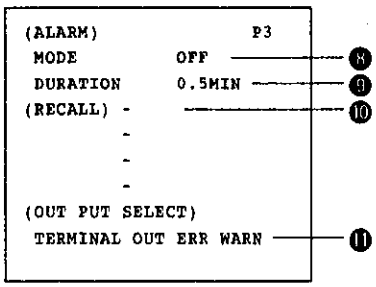
❼ **Setting of the buzzer sound**
ALARM: The buzzer sounds once alarm recording is performed.
TAPE END: When the tape end is reached in the recording mode, the buzzer sounds while the tape is at the end.
TAPE REMAIN: The buzzer sounds when there is only about 3% (with an NV-E180 tape) of the tape remaining before the end is reached in the recording mode.
ERR WARN: The buzzer sounds when the unti is set to the warning status.

To release the buzzer:
ALARM: Release alarm recording.
TAPE END: Transfer the mode from the tape end or press the STOP button.
TAPE REMAIN: Transfer the mode (but not to PAUSE or REC REVIEW) from the recording mode or press the REC button.
ERR WARN: Release the warning status.

When TAPE END and TAPE REMAIN have been set to ON, END and REMAIN flash on the display tube at the same time as the buzzer sounds. They cease flashing when the buzzer is released.

MENU SCREEN 3

The alarm recording mode is set on Menu Screen 3.



8 Setting of alarm recording and recording time mode during alarm recording (see page 25)

OFF: No alarm recording takes place even in the event of an alarm input.

ALARM: When there is an alarm input during recording in the time lapse mode, the recording time mode is switched to the designated mode (3H), and the details of the alarm status are faithfully recorded.

9 Alarm recording duration setting

This sets the time allowed to elapse from the start of alarm recording until its end. This time can be set individually from 0.5 min. to 10 min.

(0.5 → 1.0 → 2.0 → 3.0 → 5.0 → 10 → CONTINUE → MANUAL)

CONTINUE: Alarm recording continues until the tape end.

MANUAL: Alarm recording is performed while the alarm input continues.

10 Alarm recall (see page 27)

This checks the time when an alarm signal was input (up to 4 times).

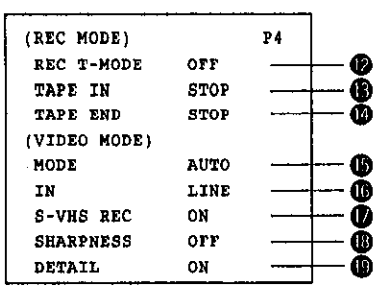
11 Terminal connector output signal setting

ERR WARN: When trouble has occurred in the unit (AUTO OFF) The LOW signal is output.

REC: When trouble has occurred in the unit during recording The LOW signal is output.

MENU SCREEN 4

The position of the display on the TV monitor and VTR modes are selected on Menu Screen 4.



12 Recording time mode selection

When recording starts, the set time mode is always established.

OFF: The time mode can be set as desired using the time mode button on the VTR's sub panel. The mode can be changed even during recording.

3H: 3-hour mode (compatible with the standard mode of ordinary VTR's).

L12H: 12-hour mode (linear slow recording)

L24H: 24-hour mode (linear slow recording)

24H: 24-hour mode (time lapse recording at 0.18 sec. intervals)

48H: 48-hour mode (time lapse recording at 0.34 sec. intervals)

72H: 72-hour mode (time lapse recording at 0.5 sec. intervals)

96H: 96-hour mode (time lapse recording at 0.66 sec. intervals)

120H: 120-hour mode (time lapse recording at 0.82 sec. intervals)

170H: 170-hour mode (time lapse recording at 1.12 sec. intervals)

13 Selection of VTR operation when cassette is inserted

STOP: Stop mode

REC: Simply by inserting the cassette tape, recording is started automatically.

REW ▶ REC: When the cassette is inserted, it is first rewound to the start of the tape and then recording is started automatically.

⓮ **Selection of operation when tape end is detected during recording (see page 24)**
STOP: Stop mode
REW: The tape is automatically rewound to the start where it stops.
REPEAT: The tape is automatically rewound to the start, and recording is repeated.
EJECT: The tape is ejected.

⓯ **Video signal mode**
This selects the operation of the colour/black-and-white automatic selector circuit.
AUTO: The circuit automatically identifies the type of video input or playback signals, and selects the colour or black-and-white mode accordingly.
B_W: The black-and-white mode is forcibly established.

⓰ **Video input signal selection**
This selects the video input signal.
LINE: The input signal from the VIDEO IN (BNC) connector is selected.
S-VHS: The input signal from the S-VIDEO IN (4-pin) connector is selected.

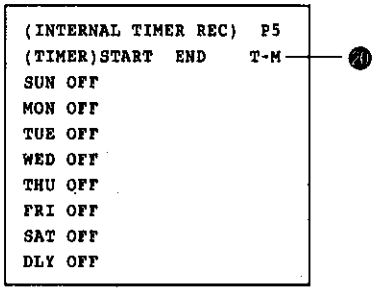
⓱ **Setting the S-VHS recording mode**
Select the S-VHS recording mode.
ON: Whether the tape is VHS or S-VHS is automatically identified, and recording proceeds in the correspond-ing mode.
OFF: Recording always proceeds in the VHS mode regard-less of the type of cassette used.
During playback, the tape type is automatically identified.

⓲ **Playback picture quality selection**
The outlines of the playback images can be emphasized.
OFF: Regular mode
ON: The playback picture has emphasized outlines.

⓳ **Playback picture detail selection**
The playback picutres can be given a softer look.
OFF: The playback pictures appear softer.
ON: Regular mode

MENU SCREEN 5

The internal timer recording modes are set on Menu Screen 5.



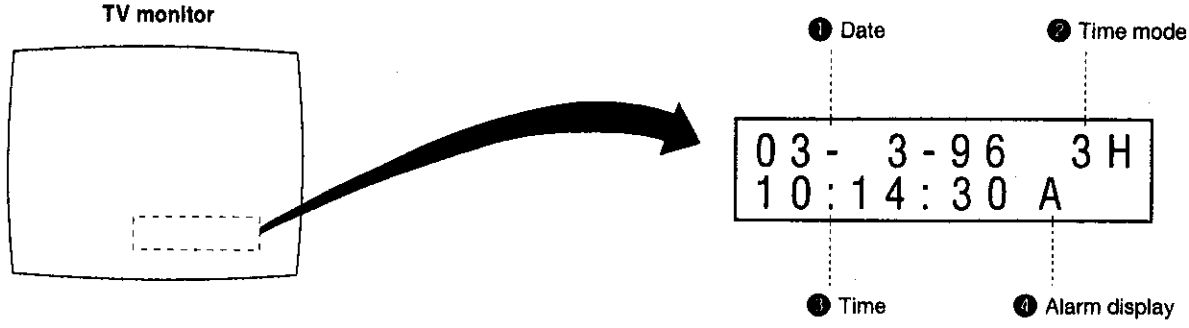
⓴ **Internal timer recording mode setting (see page 19)**
This sets the weekly timer or daily timer recording mode. (OFF/ON)
OFF: Internal timer recording is not set.
ON: Internal timer recording is set.

Note: Internal timer recording does not operate when the date and time have not been set.

CAUTION:
- The menu screens are not displayed while the unit is playing back a tape.

Date and Time Settings

This unit comes with a time/date generator which enables the date and time to be superimposed on the recording. When the power is switched on, the date, time of the day and time mode are displayed (in the case of a regular screen).

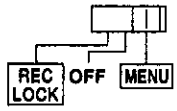
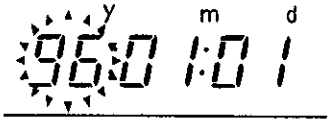
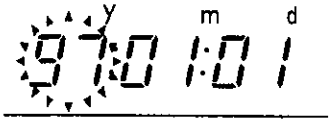
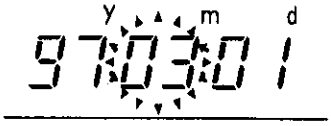


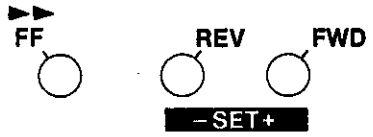
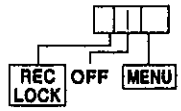
❶ **Date:**
The date appears as day/month/year.

❷ **Time mode:**
This is set by pressing the TIME MODE button. It flashes unless recording is in progress.

❸ **Time:**
The 24-hour system is used.

❹ **Alarm display:**
This appears during alarm recording.

Step	Operation **Example:** Setting the date and time to Monday, March 3, 1997 at 3:25. The time mode is set to 24 hours.	Monitor display	Display area
1	Set the MENU/REC LOCK switch to MENU. Menu Screen 1 appears, and the year digits flash. 	Menu Screen 1 (TIME ADJUST) P1 01- 1-96 MON 0:00:00	
2	Press the SET (+, –) buttons to set the year to "97". 	(TIME ADJUST) P1 01- 1-97 WED 0:00:00	
3	When the shift (▷) button is pressed, the month digits flash. Press the SET (+, –) buttons to set the month to "3". 	(TIME ADJUST) P1 01- 3-97 SAT 0:00:00	

Step	Operation	Monitor display	Display area
4	When the shift (▷) button is pressed, the day digits flash. Press the SET (+, –) buttons to set the day to "03". • The year can be set from 1996 to 2011.	(TIME ADJUST) P1 03- 3-97 MON 0:00:00	y m d 97:03:03
5	When the shift (▽) button is pressed, the hour digits flash. Press the SET (+, –) buttons to set the hour to "3". 	(TIME ADJUST) P1 03- 3-97 MON 3:00:00	TIME 3:00
6	When the shift (▷) button is pressed, minute digits flash. Press the SET (+, –) buttons to set the minutes to "5". 	(TIME ADJUST) P1 03- 3-97 MON 3:25:00	TIME 3:25
7	When the MENU/REC LOCK switch is set to OFF, the clock automatically starts running from time and date set.  For the seconds, "00" is set. Even when the switch is set to MENU, the time will keep advancing if it has not been changed.	(TIME ADJUST) P1 03- 3-97 MON 3:25:00	TIME 3:25

- To clear the date and time display, set POSITION under (DISPLAY) on Menu Screen 2 to OFF.
- Even if the power should fail for a period of up to one week, the date, time and time mode display data are stored in the memory (but only if power has been supplied continuously to the unit for 3 or more days). When the unit has just been purchased or when it has not been used for along time, the data is not stored in the memory and the display shown below appears.

(TIME ADJUST) P1
01- 1-96 MON
0:00:00

- For the date setting, the unit automatically adjusts for leap years.
- Due to temperature fluctuations and other factors, the clock time may run fast or slow with a monthly error of up to ±60 seconds. This is not indicative of malfunctioning. Reset the time at regular intervals.

Summer time setting

When the SUMMER TIME button is pressed with a small screwdriver, the time is automatically advanced by one hour, and at the same time "SUM" appears on the display. When the button is pressed again, the time returns to its original setting, and at the same time "SUM" disappears from the display.

- The above settings can also be performed at the SUMMER TIME IN connector on the rear panel.
- The following phenomenon occurs when the date and time are set with the summer time setting.

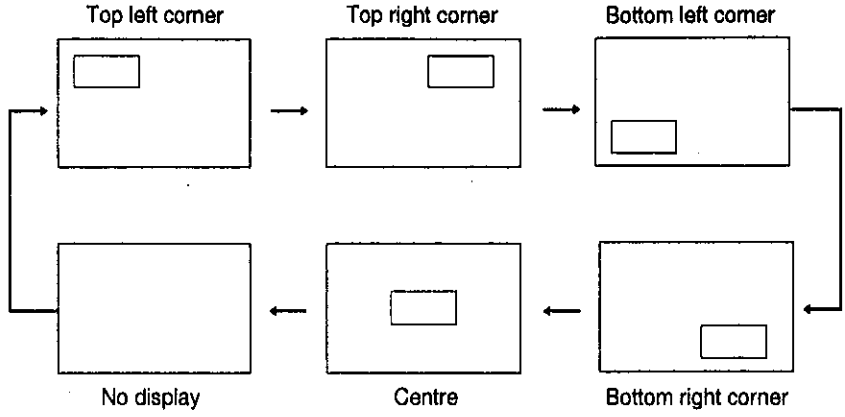
  <Example> 31 - 12 - 1996 (TUE) 23:22:00

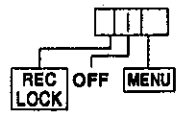
  When the "hour" has been changed, be absolutely sure to check that the date is correct.

"Hour" setting	Date	Example
23 → 0	Moved up by 1 day	1 - 1 - 1997 (WED) 0:22:00
0 → 1	Moved down by 1 day	31 - 12 - 1996 (TUE) 1: 22:00
1 → 0	Moved up by 1 day	1 - 1 - 1997 (WED) 0:22:00
0 → 23	Moved down by 1 day	31 - 12 - 1996 (TUE) 23:22:00

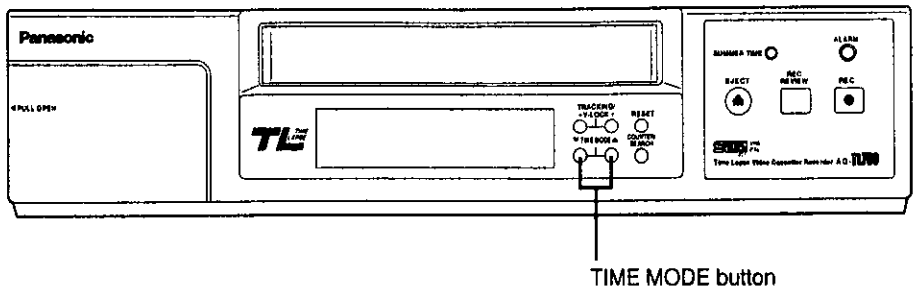
Time/Date Display Position

The position of the date and time displays on the TV monitor changes as shown below when (DISPLAY) on Menu Screen 2 is changed.



Step	Setting and operation	TV monitor display
1	Set the MENU/REC LOCK switch to MENU to display to menu screens. Press the page button to display Menu Screen 2 on the TV monitor. 	Menu Screen 2 (DISPLAY) P2 POSITION L-UPPER (REC INDICATE) NOT REC CAMERA (BUZZER) ALARM OFF TAPE END OFF
2	Press the set (+, –) buttons to position the display as desired. 	(DISPLAY) P2 POSITION L-BOTTOM (REC INDICATE) NOT REC CAMERA (BUZZER) ALARM OFF
3	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored, and the date and time appear at the selected position. 	25- 6-96 24H 4:15:23

Time Mode Selection



Refer to the table given below to select the mode that suits the intended purpose of use.

Mode	Recording enable time (in hours)		Tape replacement standard (recording times)	Video recording interval (in seconds)	Audio recording	Type of tape travel
	180-minute tape	120-minute tape				
3H	3	2	- - - -	1/50	Possible	Continuous travel
L12H	12	8	50	0.1	Possible	Continuous travel at low speed
L24H	24	16	50	0.18	Possible	Continuous travel at low speed
24H	24	16	50	0.18	Not Possible	Intermittent travel
48H	48	32	25	0.34	Not Possible	Intermittent travel
72H	72	48	20	0.5	Not Possible	Intermittent travel
96H	96	64	20	0.66	Not Possible	Intermittent travel
120H	120	80	15	0.82	Not Possible	Intermittent travel
170H	170	112	10	1.12	Not Possible	Intermittent travel

Notes on operation

- This unit is designed with the NV-E180 cassette tape as a reference.
- Depending on the type of video cassette used, the recordable time will differ.
- The actual recording enable time will be slightly longer than the "Recording enable time" given in the above table although this will depend on the tape used.
  For instance, it is possible to record for about 27 hours using a 180- minute tape in the 24H mode.
- A tape recorded in a time lapse mode can be played back in quick motion in the 3-hour mode.
- A tape recorded in the 3-hour mode can be played back in slow motion using the time lapse mode.

Selecting the cassette tape

- The unit is designed as a product required to exhibit high reliability in surveillance, security, monitoring, etc. In order to maintain its recording reliability, it is recommended that the Panasonic video tapes listed below be used.

<VHS tapes>
- NV-E180
- NV-E120
- NV-E90
- NV-E60

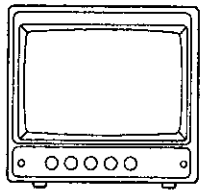
<S-VHS tapes>
- NV-SE180
- NV-SE120
- NV-SE60

- Avoid using 240-minute tapes with this unit.

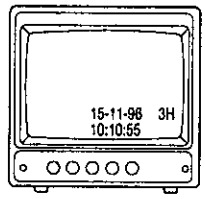
Recording Procedure

❶ Switch on the power to the connected equipment.

❷ Adjust so that the images of the video cameras appear properly on the TV monitor.



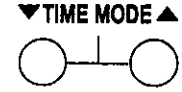
❸ Check that the date and time displayed on the TV monitor have been adjusted properly.



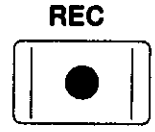
❹ Insert a cassette tape into the unit after checking that the tab on the cassette is intact.

❺ Set the timer recording, auto repeat recording, alarm recording, restoration-of-power-after-failure recording or other recording function.

❻ Select the time mode for the recording.



❼ Press the REC button.



Notes on operation

- If the PAUSE/STILL button is pressed during recording, the unit is set to the pause mode, and after about 5 minutes in this mode it is transferred to the stop mode.
- Neat frame-to-frame continuity is not achieved if the recording mode is set again after the PAUSE/STILL button is pressed during recording.
- When the MENU/REC LOCK switch has been set to OFF, other operations can be performed during recording.
- When restoration-of-power-after-failure recording is performed,recording can be continued in the same time mode even if the power should fail provided that the power is restored within about one week. (This applies only if the power has been supplied continuously for 3 or more days.)
- When performing auto repeat recording or timer recording, do not neglect to conduct the routine inspections.
- When recording images from a black-and-white camera, set the video signal mode on Menu Screen 4 to B_W.
- Remove the cassette tape if the unit is to be left standing for a prolonged period of time.
- When the power supply is interrupted during recording (with the power switch still ON), a non-recorded portion will be made in the beginning of the tape travel, or the tape will be over-recorded at its ending section. But this is not a malfunction.

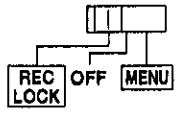
Tips For Better Recording

In order to ensure greater reliability in monitoring, surveillance and other continuous operations lasting many hours, this unit comes with some safety functions for recording. Read the following descriptions of these functions before proceeding to operate the unit.

Recording mode lock

There are two ways, as described below, to maintain the recording mode during recording by disabling the operations of the power switch as well as the TIME MODE and operation buttons.

❶ Set the MENU/REC LOCK switch to REC LOCK.



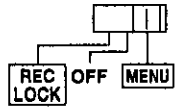
❷ Set REC LOCK on Menu Screen 1 to ON. (See Note)

The following switch and connectors are operational even if the MENU/REC LOCK switch is set to REC LOCK.

- Alarm input connector, alarm reset connector
- REC REVIEW

Hour Meter

By showing for how many hours the unit has been used, this meter provides useful information for regular inspection, maintenance and servicing involving the cleaning and replacement of the inside parts, etc. When the MENU/REC LOCK switch is set to MENU, the hour meter will appear on the TV monitor together with the date and time settings.



Menu Screen 1

```
(TIME ADJUST)      P1

01- 1-96 MON
 0:00:00

(REC LOCK)
 MODE      OFF

(HOUR METER)
    00000H
```

The regular screen is restored when the MENU/REC LOCK switch is set to OFF.

Recording check

When the REC REVIEW button is pressed during recording, the tape runs temporarily in the reverse direction, and the recorded section is played back. This function can be used to check the daily operation of the equipment in the system.

Restoration-of-power-after-failure recording

When a power failure has occurred during recording, the unit automatically starts recording if the power is restored within approximately one week.

- When the power fails, the tape "losing" safety protection function is activated to protect the video heads and video tape.

Before power is restored	After power is restored
• Stop, play, fast forward	Stop mode is established.
• Recording	Recording mode is established.
• Auto rewind • Auto rewind during auto repeat recording	Unit is returned to the mode applying before the power failed.

The table given below shows what happens after the power is restored when VIDEO MODE "IN" on Menu Screen 4 has been set to "LINE".

Before power is restored	After power is restored
• Recording	Recording mode is established.
• Tape is being rewound in auto repeat recording.	Recording mode is established after tape has been rewound.
• Any other mode	Stop mode is established.

- If the power is restored after a power failure when the remaining charge of the back-up battery is low, the unit automatically proceeds with recording in the 24H mode of the EXT REC mode. However, unless REC T-MODE on menu screen 4 has been set to OFF, recording will commence in the time mode set.

Note:
Once the recording mode is established, recording cannot be released until REC LOCK on Menu Screen 1 is set OFF.

Timer Recording

There are two methods of timer recording: one uses the internal timer and the other uses an external timer.

Internal timer recording

Start time and stop time

Bear in mind the following points when setting these times.

- **When the stop time is set later than the start time:**
  Recording will commence at the start time on the day concerned and stop at the end time on the same day.

  Example: 8:30 <17:00

- **When the start time is set later than the stop time or the start time and stop time for weekly recording (weekly timer) are the same:**
  Recording starts at the start time on the day concerned and ends at the stop time on the following day.

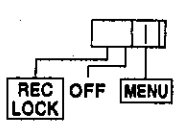
  Example: 17:00 <8:30

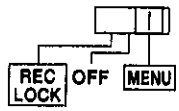
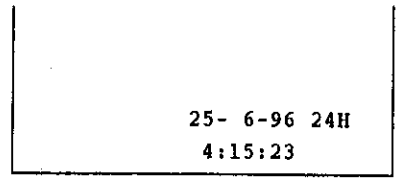
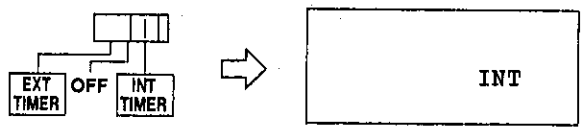
- **When the start time and stop time are the same (for weekly recording):**
  Recording starts at 8:30 on the day concerned and ends at 8:30 on the following day.

  Example: 8:30 = 8:30
  To record for an entire day, set the start time and stop time to 00:00.

- Weekly recording (weekly timer) can be set by the day of the week.
- When (INTERNAL TIMER REC) on Menu Screen 5 is set to OFF for both the weekly timer and daily recording (daily timer), nothing appears for the start or stop time. Timer recording is considered not to be set.

Internal timer recording operation

Step	Operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Check that the TV monitor shows the correct present time.	25- 6-96 24H 4:13:08
3	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button so that the INTERNAL TIMER REC timer setting screen appears on the TV monitor.  	Menu Screen 5 (INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN OFF MON OFF TUE OFF WED OFF THU OFF FRI OFF SAT OFF DLY OFF

Step	Operation	TV monitor display
4	Set the operation times of the internal timer. • For details on the settings, refer to the sections on "Daily timer" or "Weekly timer." (See page 21 to 22.)	
5	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored. 	
6	Set the TIMER MODE (REC MODE) switch to INT TIMER so that INT lights on the display. (The internal timer lamp also lights.)  Display When a cassette has not been inserted, the timer has not been set or a cassette with a broken out tab has been inserted, the internal timer lamp flashes, and INT on the display also flashes. When the recording time arrives, nothing will be recorded.	

VTR operations after the settings

- The unit's power is turned off, and even if other buttons are pressed, their operations are not accepted.
- When the start time and stop time have not been set, INT flashes on the display.
- Alarm recording is performed in the event of an alarm input even when the unit is in the timer recording standby mode. When alarm recording is completed, the power is switched off and the unit is set to the timer recording standby mode.

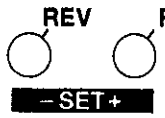
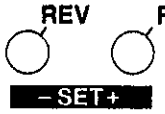
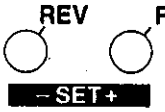
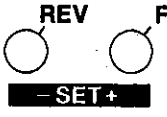
Releasing the internal timer mode

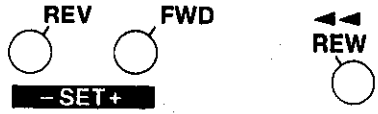
Set the TIMER MODE (REC MODE) switch to OFF to clear INT on the display.

Note:

- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

Daily Recording (Daily Timer)/Weekly Recording (Weekly Timer)

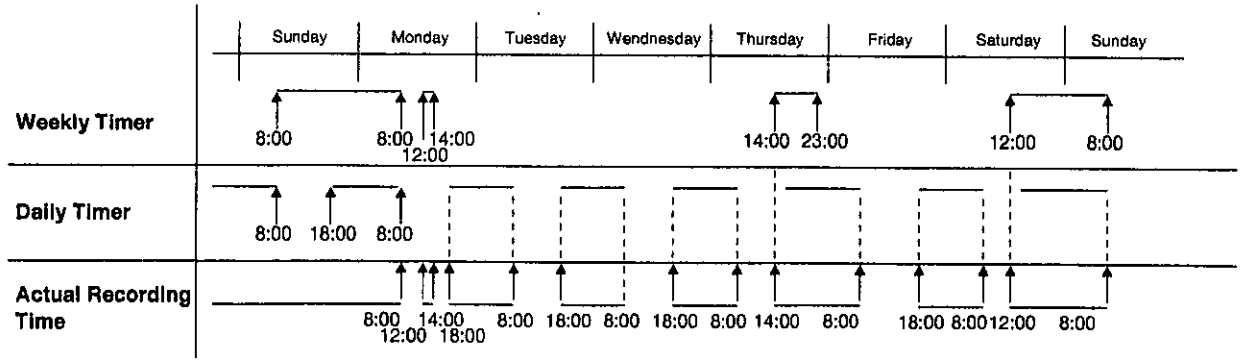
Step	Selection and operation	
	When recording from 8:30 to 12:00 from Sunday through Thursday and from 9:00 to 12:00 on Fridays and Saturdays	TV monitor display
1	Check that OFF or ON for Sunday (SUN) is flashing. If the setting is OFF, press the set (+, –) buttons to display ON. 	Menu Screen 5 (INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN OFF MON OFF
2	When the shift (▷) button is pressed, the setting moves to the start time and the "hour" digits flash. 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 0:00 0:00 MON OFF
3	Press the set (+, –) buttons to display "8." 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:00 0:00 MON OFF
4	When the shift (▷) button is pressed, the "minutes" digits flash. 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:00 0:00 MON OFF
5	Press the set (+, –) buttons to display "30." 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:30 0:00 MON OFF
6	When the shift (▷) button is pressed, the "hour" digits flash. 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:30 0:00 MON OFF
7	Press the set (+, –) buttons to display "12. " 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:30 12:00 MON OFF

Step	Selection and operation	
8	When the shift (▷) button is pressed, the "minutes" digits flash. 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:30 12:00 MON OFF
9	Press the set (+, –) buttons to display "00." Press the shift (▷) button and set the recording time mode. When the shift (▽) button is pressed, the MON is flashing. 	(INTERNAL TIMER REC) P5 (TIMER)START END T-M SUN ON 8:30 12:00 MON OFF
10	Following the same procedure in steps 1 to 9, display the start time of "8:30" and stop time of "12:00" from Monday (MON) through Thursday (THU). Following the above procedure, set the times for Friday (FRI) and Saturday (SAT) as well. In this way, the timer operation times have been set for each day of the week. The settings for daily recording (daily timer) are also performed following the same steps 1 to 9.	

- When daily recording and recording by day of the week are to be conducted together, the timer recording operations will be as shown below when the time settings are as follows.

```
(INTERNAL TIMER REC)  P5
(TIMER)START  END     T-M
SUN ON  8:00   8:00   120
MON ON 12:00  14:00   120
TUE OFF
WED OFF
THU ON 14:00  23:00   120
FRI OFF
SAT ON 12:00   8:00   120
DLY ON 18:00   8:00   120
```

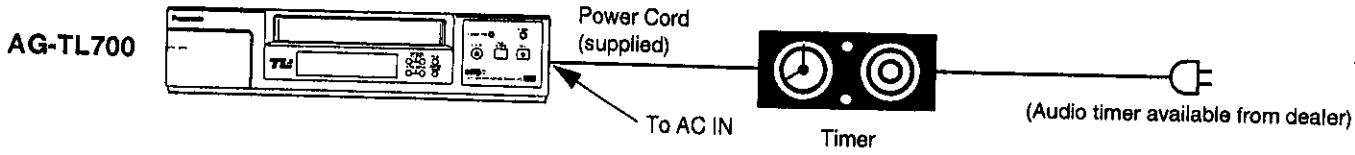
The setting shown on the screen at the left translates into the weekly and daily timer recording combinations shown below which, in turn, means that the actual recording time on the tape is shown at the bottom.



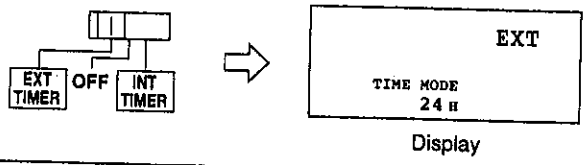
- The day of the week time settings are displayed, enabling the settings to be checked for each day of the week.
- When the weekly timer and daily timer recording functions are used in combination, the time mode set for weekly timer recording takes precedence if there should be any overlap between the two time settings.

External Timer Recording

The unit can be made to record using an external timer to turn on its power.



External timer recording operations

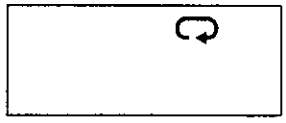
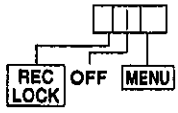
Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the TIMER MODE (REC MODE) switch to EXT TIMER so that EXT lights on the display. At the set time, power is supplied from the external timer and the unit is set to the recording mode.  Display	
3	When setting the EXT TIMER, ensure that the VTR is in waiting the TIME MODE showing in the display.	

- If the video cassette tape has not been inserted or if its accidental erasure prevention tab has been broken, EXT will flash on the display, and external timer recording cannot be conducted.
- Since it takes some moments for recording to start, set the start time for timer recording one minute earlier.

Auto Repeat Recording/Auto Rewinding

Auto repeat recording: This function automatically rewinds the cassette tape when its end is detected in the recording mode, and it repeats recording from the start of the tape.

Auto rewinding: This function automatically rewinds the tape to the start when the tape end is detected in the recording mode.

Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display Menu Screen 2 on the TV monitor. 	Menu Screen 2 (DISPLAY) P2 POSITION L-UPPER (REC INDICATE) NOT REC CAMERA (BUZZER) ALARM OFF TAPE END OFF TAPE REMAIN OFF TAPE WARN OFF
3	Press the shift (▽) button to move the flashing to TAPE END. Press the set (+ or –) button to display REPEAT for auto repeat recording or REW for auto rewinding. 	(DISPLAY) P2 POSITION L-UPPER (REC INDICATE) NOT REC CAMERA (BUZZER) ALARM OFF TAPE END REPEAT TAPE REMAIN OFF TAPE WARN OFF
4	"⟲" lights on the display.  Display • If auto rewinding has been selected, "⟲" is cleared.	
5	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored. 	25- 6-96 24H 4:15:23

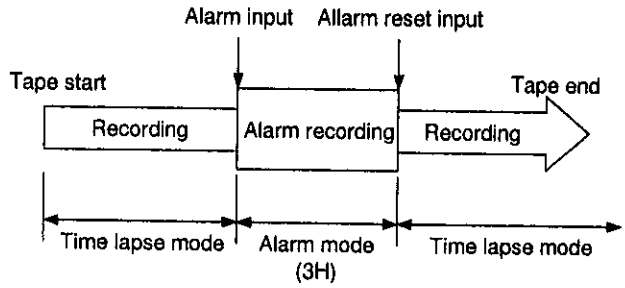
Notes of operation

- Alarm signals are not accepted during auto rewinding, and so alarm recording is not performed.
- If an alarm signal is supplied during auto repeat recording, the alarm recording mode is established. If the tape then reaches its end, auto repeat recording is performed but alarm recording is released.

Alarm Recording (Emergency Recording)

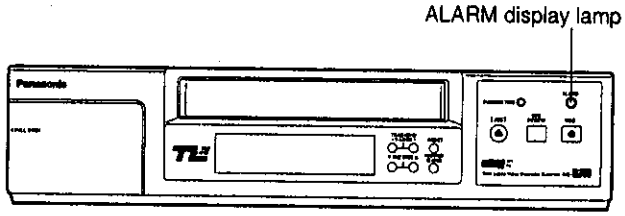
When an emergency occurs at the monitoring site during prolonged monitoring and recording, the alarm function is automatically triggered, and alarm recording is performed.

Principle of alarm recording

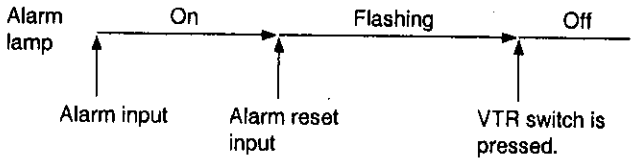


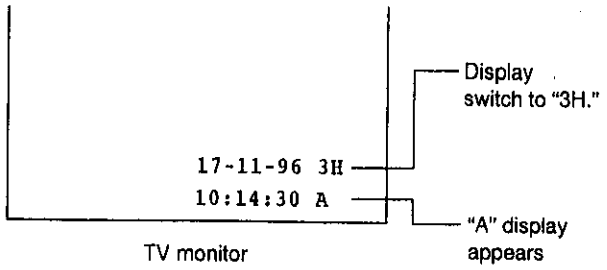
- When an alarm signal is supplied by an alarm sensor (door or intercom switch, etc.) during recording in a time lapse mode, the recording speed is switched to the 3-hour mode and the details of the state of emergency are faithfully recorded.

Alarm and display methods during alarm recording

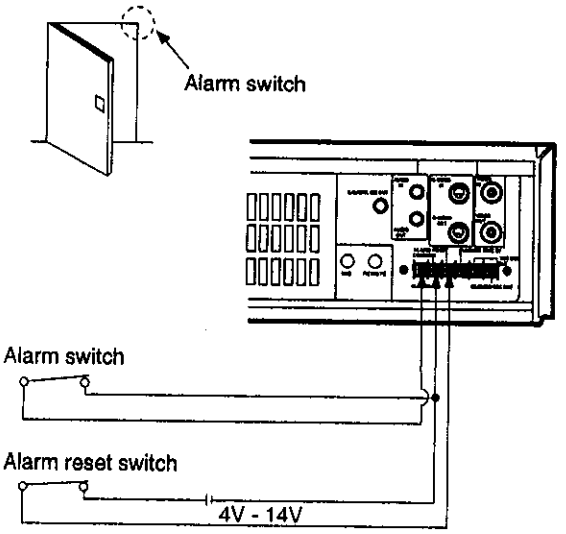


- When an alarm signal is supplied, the alarm display lamp functions as follows.



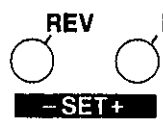
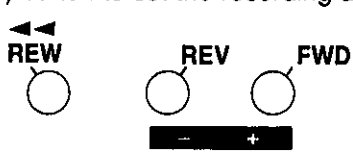
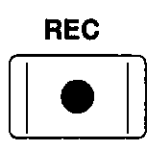


Connecting the alarm input connector



- Alarm recording starts when the alarm switch is set on. When the alarm reset switch is set ON after recording has started, alarm recording is released and operation is returned to the original time lapse recording mode.
- Alarm recording can be released by pressing the STOP button during alarm recording.
  However, it cannot be released even by pressing the STOP button if the MENU/REC LOCK switch is at REC LOCK or INT is lighted on the display.
- Alarm recording can be automatically reset without supplying the alarm reset input signal.
  The reset time can be set for 0.5, 1.0, 2.0, 3.0, 5.0 or 10 minutes.
- Another option is alarm recording only while the alarm input signal is supplied.
- Alarm recording is also possible as far as the end of the tape.

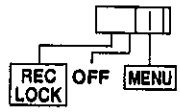
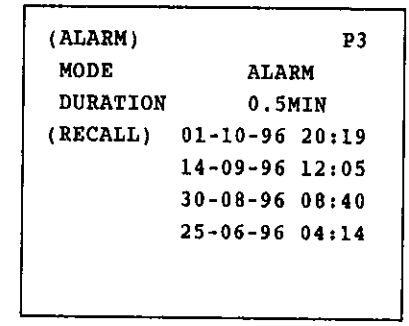
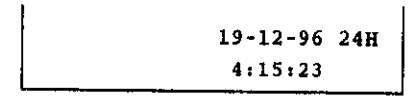
Alarm recording operation

Step	Selection and operation	TV monitor display
1	Check that a video cassette with its tab intact has been inserted.	
2	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor. 	(ALARM) P3 MODE OFF DURATION 0.5MIN (RECALL) - - - -
3	Press the set (+ or –) button to display ALARM for MODE. 	(ALARM) P3 MODE ALARM DURATION 0.5MIN (RECALL) - - -
4	Press the shift (▽) button to move the flashing to T-MODE. Press the set (+ or –) button to set the time mode. 	(ALARM) P3 MODE ALARM DURATION 0.5MIN (RECALL) - - -
5	Press the shift (▽) button to move the flashing to DURATION. Press the set (+ or –) button to set the recording duration. 	(ALARM) P3 MODE ALARM DURATION 0.5MIN (RECALL) - - -
6	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.	25- 6-96 24H 4:15:23
7	Press the REC button.  If an alarm input signal is subsequently supplied, the time mode set by T-MODE changes to 3H, and alarm recording continues until the alarm is released.	

- If TAPE END on Menu Screen 4 has been set to REPEAT, the auto repeat recording mode is established when the tape comes to the end.
- With emergency recording, set the unit to the POWER OFF or STOP mode.

Alarm Recall

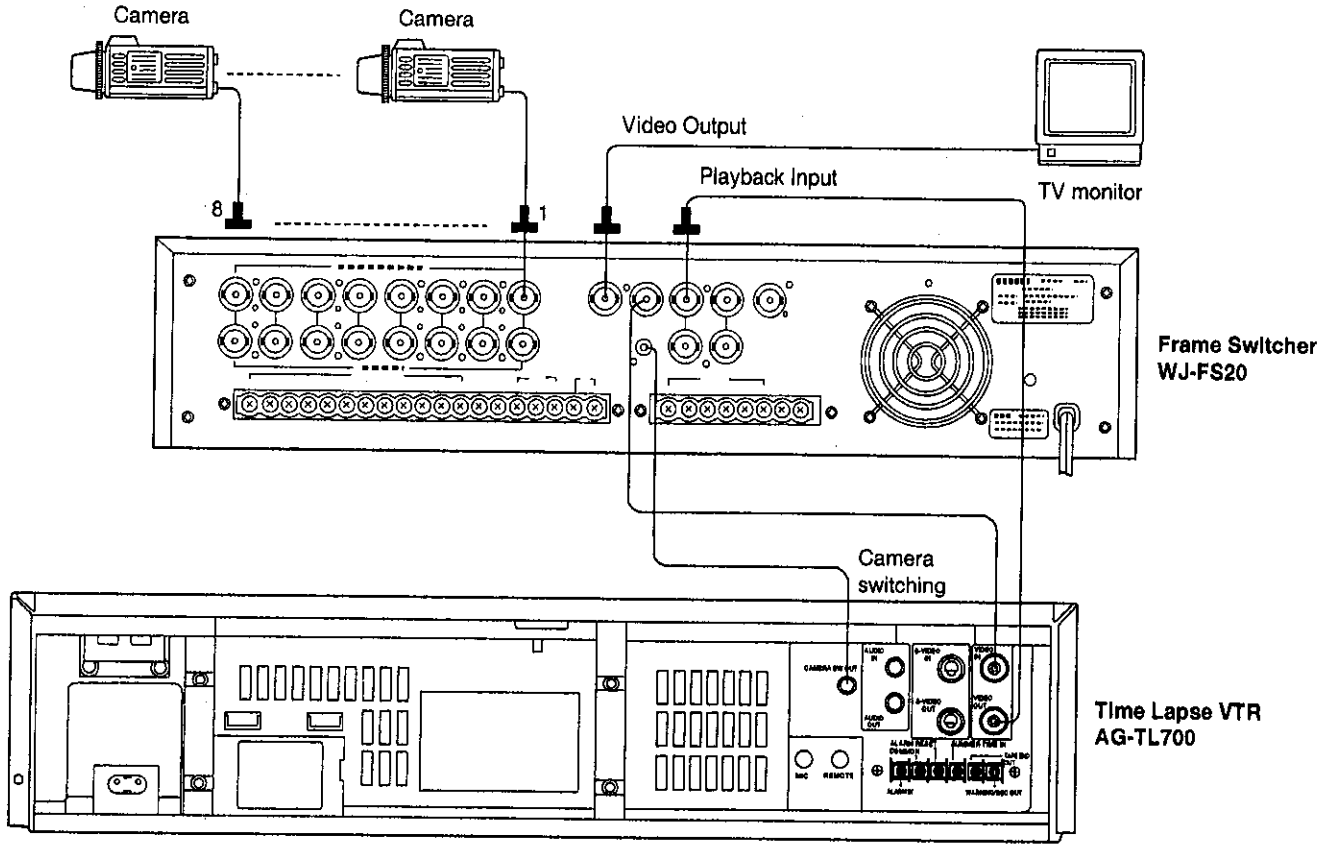
The time when the alarm signal was input can be ascertained on the TV monitor by checking the alarm input time in the RECALL item on Menu Screen 3.

Step	Selection and operation	TV monitor display
1	Set the MENU/REC LOCK switch to MENU to display the menu screens. Press the page button to display the alarm recording setting screen (Menu Screen 3) on the TV monitor. 	
2	Upon completion of the settings, set the MENU/REC LOCK switch to OFF. The regular screen is restored.	

- The alarm recall function stores up to 4 alarm input times in the memory and displays them on the screen. If there have been more than 4 inputs, they will be deleted from the screen in sequence starting with the oldest data.
- When the RESET button is pressed while Menu Screen 3 is on the display, the alarm recall memory can be cleared.

Frame Switcher Connection and Recording

Connections (using the WJ-FS20)



- Do not supply signals from colour cameras and black-and-white cameras simultaneously to the camera input conectors since this may disturb the synchronization on the monitor screen or generate noise.

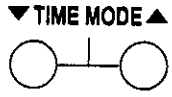
Playback Procedure

Before operating the unit, check that the internal/external timer recording displays (INT/EXT) have been cleared from the display. (If INT or EXT is displayed, set the TIMER MODE switch to OFF to clear it.)

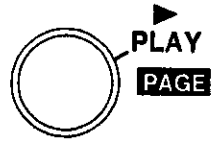
❶ Switch on the power to the unit and TV monitor.

❷ Insert the recorded cassette tape into the unit.

❸ Select the time mode.



❹ Press the PLAY button.

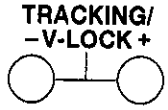


Notes on operation

1. Bear in mind the following points when playing back parts of a tape recorded in a time lapse or linear slow mode.
   - When the tape is played back in the same mode, noise resembling dropouts will appear on the screen: this is not indicative of malfunctioning.
   - The picture may oscillate in the vertical direction: this is not indicative of malfunctioning.
   - When a tape is played back in the same time mode, the picture may shake slightly sideways: this is not indicative of malfunctioning.
   - Turn Quasi-V insertion ON (▮▶) or OFF (▶) with the FWD ADV button. Dancing can be minimized when a tape is played back in a time lapse (exept 3-hour) or linear slow mode.
2. Bear in mind the following points when playing back parts of a tape recorded in a VHS/S-VHS mode (3 hours).
   - When a tape is played back in a time lapse mode, slight noise may appear at the top and bottom of the screen: this is not indicative of malfunctioning.
   - When the tape is played back in the L12H or L24H mode, the picture may oscillate in the vertical direction: this is not indicative of malfunction.
3. When noise has occurred during still-picture playback, press the FWD ADV button to play it out.
4. Bear in mind that if the power cable is disconnected and then re-connected or if the power has been restored after it has failed when the tape was played with EXT indicated on the display by the TIMER MODE switch, the unit will automatically be set from playback to the recording mode.
5. When the PAUSE/STILL button is pressed during playback, the unit is set to the pause mode, and a still picture will appear on the monitor screen. To release this state, press the PAUSE/STILL button again or press the PLAY button. If the unit is kept in the pause mode for more than 5 minutes, it will be set to the stop mode.
6. If the horizontal AFC on the TV monitor is too long or when a video camera with random interlace scanning has been used, the top area of the TV monitor may be distorted: this is not indicative of malfunctioning.

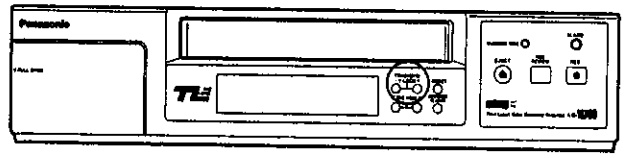
Tracking

When noise such as that shown below appears on the playback image, press the tracking (+ or –) button to minimize the noise.



Vertical hold adjustment

If the image shakes slightly in the vertical direction during still-picture playback, press the vertical hold buttons (–, +) to reduce the dancing.



- If the TV monitor has a vertical hold control, adjust that control also.

Routine & Regular Inspection Request

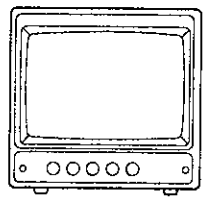
This unit is designed to withstand many hours of operation. Nevertheless, it is recommended that routine inspections be conducted to help ensure trouble-free operation.

CAUTION
Do not forget to conduct the routine inspection with auto repeat recording.

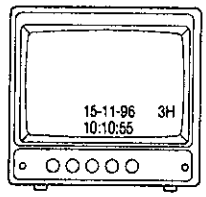
Routine inspection procedure

❶ Set the power switches on the unit, video cameras, TV monitor and otherequipment connected in the monitoring system to the ON position.

❷ Is the picture on the TV monitor OK?

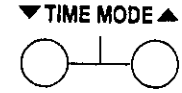


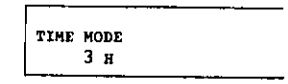
❸ Are the date and time displayed on the TV monitor correct?



❹ Rewind the cassette tape, which was recorded on the previous day, by an amount equivalent to a count on the counter of several figures.

❺ Press the TIME MODE button to set to the mode to 3H (3 hours).





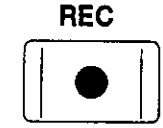
Display

❻ Press the PLAY button. The tape is played back by an amount equivalent to a count on the counter of several figures.

❼ Is the playback image OK?

❽ Is there any problem with the recorded date and time?

❾ Press the REC button.



❿ Check the playback images which were recorded in the 3-hour time mode.

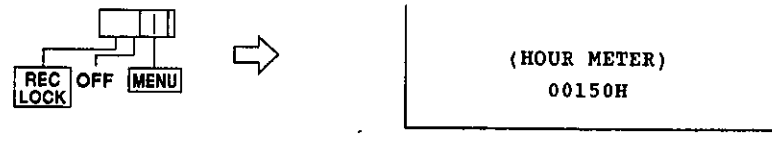
⓫ Upon completion of all the checks, set the unit to the desired mode.

Action taken after routine inspections

In the unlikely event of a problem with the unit, turn off the power, take hold of the power plug and disconnect it from the power outlet, and consult with the dealer from whom the unit was purchased.

Regular inspections recommended

This unit has an hour meter which shows for how many hours the VTR has been used. When the MENU/REC LOCK switch is set to MENU, Menu Screen 1 appears on the TV monitor, and the hour meter can be checked. Use the hour meter as a rough guideline to cleaning or replacing the parts inside the unit. For further details, consult with your dealer.



TV monitor

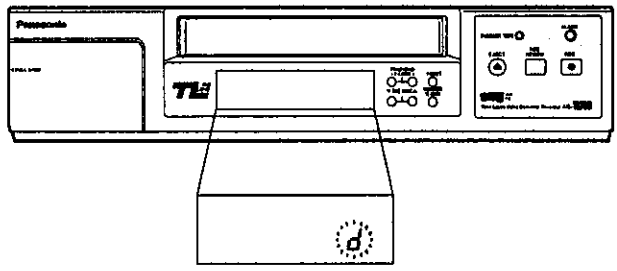
Troubleshooting

Trouble with installation

No power.	• Is the power plug inserted properly into the AC outlet?
No picture.	• Is the unit connected properly with the TV, video cameras, etc.? • Are any of the connecting cables making faulty contact?
Indistinct picture.	• Has the focus on the video cameras been adjusted correctly?

Trouble with functions or operation

Nothing happens even when operation buttons are pressed.	• Is the video cassette loaded? • Is the MENU/REC LOCK switch at OFF? • Has the video cassette been inserted properly? Press the EJECT button to eject the cassette and insert properly. • Has INT lighted on the display?
"d" mark is flashing.	• The unit will not operate because its safety protection function has been triggered. Wait until the flashing disappears.



In case of moisture detection:

The "d" mark at display section flashes.

↓

Ejection will remain incomplete when a video cassette has been inserted.

↓

Wait until the "d" mark goes out with VTR switch turned "ON". It may take a few hours, although it depends upon conditions.

Date and time display data has not been stored in memory when the power failed.	• Has the unit's power plug been disconnected from the power outlet for a long time? Insert the unit's power plug into the power outlet and supply power continuously for at least 3 days to the unit.

Trouble with recording

Tape can be played, fast forwarded or rewound but not recording results.	• Is the tab on the video cassette broken?
Recording has stopped.	• Is the video cassette tape at its end? • Have more than 5 minutes elapsed since the PAUSE/STILL button was pressed during recording? • Are the routine inspections being carried out? If this phenomenon keeps recurring, it means that some failure or other is to blame. Consult with your dealer.

The power has been restored after a power failure but recording does not automatically resume.	• Has the power failure lasted a long time (more than 1 week)? Set the timer recording switch to EXT to ensure that the unit is set to the recording mode even after a prolonged power failure.
Recording cannot be stopped.	• First set the MENU/REC LOCK switch to OFF and then operate. • Is REC LOCK on Menu Screen 1 at OFF?
1-week programmed timer recording cannot be conducted properly.	• Are the date and time on the regular displays correct? (See page 12)
One or more cameras do not record when a multiple number of cameras are used.	• Turn the time adjustment control on the sequential switcher, and adjust it to a setting which is longer than the video recording duration in the recording time mode. • Connect a camera switching cable between the unit and frame switcher. (See page 28)
No auto repeat recording.	• Has the stop button been pressed during auto rewinding?
No timer recording.	• Are the present time and start/stop times for the timer recording correct? • Has INT or EXT lighted on the display?
No alarm recording.	• Have the alarm sensors and alarm input connectors been connected properly? • Has the alarm recording mode been selected on Menu Screen 3?

Trouble with playback

Noise sometimes appears on the playback pictures.	• Adjust the tracking buttons. (See page 29)
Dirty playback picture.	• The video heads may be dirty or clogged or they may have reached the end of their service life. Consult with your dealer.
"Snow" on playback picture.	• The video heads may be dirty or clogged. Consult with your dealer.
While a multiple number of cameras are being used, two scenes appear as the playback picture when the cameras are switched.	• Has the camera switching signal cable been connected properly?
Recording starts when the unit's power plug is connected to or disconnected from the power outlet.	• Has INT or EXT lighted on the display?
No playback because recording starts when the main power for the connected equipment is set to ON.	• Has INT or EXT lighted on the display?

Specifications

Power Source:	220 – 240 V AC, 50 – 60 Hz
Power Consumption:	20 W

General

Operating Temperature:	5°C to 40°C
Operating Humidity:	35% to 80%
Dimensions:	430(W) × 100(H) × 290.5(D) mm
Weight:	Approx. 4.7 kg
Video Recording System:	4 rotary heads, Azimuth recording system, VHS/S-VHS formats
Tape Speed:	23.39 mm/s (3H mode)
Tape Format:	S-VHS/VHS tape
Recording Time:	3/L12/L24/24/48/72/96/120/170 hours
FF/REW Time:	Approx. 3 min. (with 180-minute tape)

Video

Television System:	CCIR Standard (625 lines, 50 fields) PAL colour signal	
Modulation System:	Luminance;	Frequency modulation recording
	Colour signal;	Converted subcarrier phase shift recording
S-VIDEO Input (4P):	Y;	1.0Vp-p, 75 ohms, unbalanced
	C;	0.3Vp-p (burst), 75 ohms, unbalanced
Video Input (BNC):	1.0Vp-p, 75 ohms, unbalanced	
S-VIDEO Output (4P):	Y;	1.0Vp-p, 75 ohms, unbalanced
	C;	0.3Vp-p (burst), 75 ohms, unbalanced
Video Output (BNC):	1.0Vp-p, 75 ohms, unbalanced	
Horizontal Resolution:	B/W mode;	320 lines (VHS)
		400 lines (S-VHS)
	Colour mode;	240 lines (VHS)
		400 lines (S-VHS)
S/N:	B/W mode;	45 dB (3H mode, VHS/S-VHS)
	Colorur mode;	45 dB (3H mode, VHS/S-VHS)

Audio

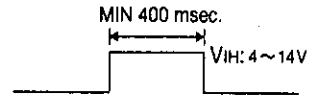
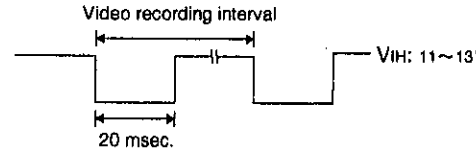
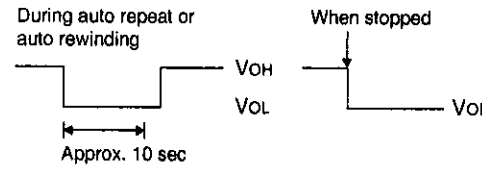
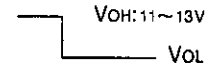
Line Input (Phono):	–10 dBv, 47 kohms, unbalanced
Mic Input (3 mm):	–60 dBv, 600 ohms, unbalanced
Line Output (Phono):	–8 dBv, 1 kohm, unbalanced
Track:	1 track (normal)
Recording/Playback mode:	3H/L12H/L24 mode

Standard accessory

Power Cord:	× 1

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Input/Output Terminal Signal Level

Terminal	Signal Level	Note
Alarm Input/Summer Time Setting Input		LOW Input
Alarm Reset Input		HIGH Input
Camera Switching Output		VOH = 11–13V (5.6kΩ) VOL = 0–0.6V (max. 3 mA)
Tape end output		VOH = 11–13V (4.7kΩ) VOL = 0–0.6V (max. 3 mA)
Warning output		VOH = 11–13V (4.7kΩ) VOL = 0–0.6V (max. 3 mA)